Nate Calkins and Mango Salsa Tilapia

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Marie: You're listening to The Fish Dish, brought to you by Eat Wisconsin Fish, a campaign of the Wisconsin Sea Grant Program. Are you fish-curious? Or are you a fish expert who wants to learn even more about Wisconsin's fisheries and cooking fish? We'll give you the latest "dish" on fish.

Your hosts are . . .

Sharon: Sharon Moen

Marie: and Marie Zhuikov

Together: Two friends who have been working for Sea Grant seemingly forever and who know a thing or two about fish.

Marie: But that's "forever" in a good way.

Sharon: Sharon runs the Eat Wisconsin Fish campaign

Marie: and Marie is a science communicator.

Marie: In this episode, we'll meet Nate Calkins, owner of Lake Orchard Farm Aquaponics in Sheboygan, Wisconsin. In the second, "Fish-o-Licious" part of the show, we'll be cooking Tilapia topped with mango salsa.

Sharon, why don't we start off with an explanation of aquaponics. What kind of business is it?

Sharon: Well, aquaponics is the combination of raising fish and vegetables at the same time using the same system. So, the fish get fed and then they grow in their tanks and then you use the waste from the fish – the extra food and excrement – to fertilize the plants. The plants grow robustly and then all that water is circled back into the fish system.

Marie: After the plants clean it, right?

Sharon: Right. And it really cuts down on water waste. Ninety percent or more of the water is recycled in these kinds systems.

Marie: Cool!

Sharon: It's really an energy and environmentally efficient way to raise both crops – both fish and plants.

Marie: So, in Wisconsin, what kinds of aquaponics facilities do we have?

Sharon: Oh, there's such a variety. It's really interesting. It ranges from a shrimp-grower who uses the waste from the shrimp to throw on his tomatoes -- heirloom tomatoes, they're really special, to humungous systems like the one at Superior Fresh that grows Atlantic salmon in combination with acres of leafy greens like lettuces.

Marie: Nate, who we'll be meeting in this episode, how did you happen to run into him?

Sharon: Well, when I was hired on with Sea Grant, I was supposed to call up all the fish growers and commercial fishermen and introduce myself and ask how Sea Grant might be of service to them. When I called Nate, he just had this passion about what he was doing and tilapia, and why he was growing it, and why he wished other people would grow this tilapia. Then he told me about this event he was having – a big fish boil in the end of summer with a band in his barn, and he invited Sea Grant to show up at that and see what was going on. I was like, "Of course, I want to go!" While I was there, I wanted to interview him about what he was doing and why because he was such a passionate spokesperson for why aquaculture and aquaponics specifically could be the way to feed people in the future.

Marie: It sounds like Nate grows tilapia. What kinds of veggies does he grow?

Sharon: Mostly the leafiest of leafy greens like lettuces and microgreens for fancy restaurants and your own table, and things like red sorrel, which are specialty greens that some of the fancy chefs like to use.

Marie: Ah, interesting!

Sharon: I know. I didn't bring any of them today. Sorry.

Marie: Darn. What's wrong with you? (Laughs) Okay, let's hear from Nate. Here he describes how he got into the business.

Nate Calkins:

I went to school for engineering and did that for some years. I was approached by my inlaws, my wife's family, to have an opportunity to take over the family farm. It was an older farm. It had been in the family at that time for five generations. We are the sixth to actively run it. It's been in the family since 1848.

We decided to make some interesting new moves and decisions. Our space here along Lake Michigan justified a hospitality circumstance so we operate a bed and breakfast, an event barn, we have a tourist rooming house and we have a nine-hole golf course and football course on site also. But from an ag standpoint, the ag industry we were in, which was custom-raising replacement heifers for local dairies, was not really a good coincidental business for a hospitality market. A lot of manure, a lot noise, a lot of flies, things like that. We wanted to stay ag-minded. We still have our tillable ground that is farmed for local farms – grain production and whatnot -- but from an ag standpoint I wanted to get into something that was not only more sustainable but a lot cleaner and a cleaner environment for employees to work in. After doing a lot of research about different farming options, aquaponics really hit me right in that it is very water conservative.

Marie: I get the impression that, people might think that because it's an aquaponics facility, that it uses a lot of water because you have to water the plants and the fish need water, of course, to survive. But we talked earlier about how it is a water-conservative business and, why don't we talk a little bit more about that?

Sharon: Right, so for the whole system, there is a lot of water involved. There's the entire greenhouse and then there's the tanks of fish. All that has a lot of water associated with it. But after the initial outlay of water, most of it gets recycled. The plants take up some, of course, and evaporation accounts for some of the water losses. But most of the water, I'd say upwards of 90% or more, gets recycled back

into the system and just used over and over. So there's not a lot of waste that gets put out into the ground or in the soil. It's really a conservative system.

Marie: Wow, that's really interesting. I've gotten the chance to see a couple of aquaponics facilities in the state. What impressed me was how clean they are.

Sharon: The ones I've been to have also been super clean. I grew up across from a dairy barn. I don't know if you knew that about me.

Marie: No!

Sharon: Yes. There were about 200 head of dairy cows there and I loved everything about being on a dairy farm. We used to make hay forts and go pet the cows and I helped milk sometimes.

Marie: So, you must have had friends at this dairy barn. Not just the cow friends.

Sharon: Yes, yes, my best friend across the . . . So, I grew up loving even the smell of manure. But I get why it's not everybody's cup of tea. And certainly, as communities have grown, some of the farms I grew up near went out of business mainly from the pressure from developments around them. But also, the price of beef and milk just dropped. A lot of the farmers were scrambling to figure out how to keep the farms in their family and be more diverse in their holdings. In these operations where they've brought in fish and vegetables – these aquaponics facilities – you don't smell the cows and there are not flies.

Marie: You don't even smell the fish.

Sharon: No.

Marie: It doesn't smell fishy.

Sharon: It does not smell fishy, either. (Laughs) It's super clean and a interesting way to get both our protein and our vegetables while keeping farms in these multi-generational families.

Marie: In this next section, Nate talks about the research he did before they decided to grow tilapia.

Nate:

The cattle I was raising go through a lot of water. Our springing heifers would drink up to 45 to 50 gallons of water per day per animal. That's a lot of consumption. From a standpoint of what kind of animal we were going to raise, we talked about chickens, we talked about hogs, we talked about all sorts of different feeder stocks but after really evaluating the efficiency behind aquaculture and fish meat production, versus the amount of protein that needs to be put into that animal or species, they're unbelievable in comparison to cattle.

National Geographic, just to not quote too much, did some study and analysis on that and what it more or less comes down to is that fish are one-to-one protein in equals protein out. Cattle can be as high as 50 units of protein in to gain one unit of protein out in beef. That coupled with the fact that raising that kind of stock obviously produces a lot of ozone-depleting gases, so I wasn't a huge fan of that, either.

Sharon: Yeah, I really agree with what Nate was saying there, that the feed-conversion ratio that fish have compared to some of the other protein sources like cattle, pigs and chickens that we associate with

our food, is incredible. If we're really trying to live more lightly on the planet, that would be a great way to start is eating more fish and understanding where the protein is coming from.

Marie: Speaking of protein… (laughs)

Sharon: That's where the protein is coming from.

Marie: Let's talk about tilapia. Where does tilapia come from?

Sharon: Some of it now comes from Wisconsin, of course. We have a couple good tilapia farms, bigger type tilapia farms like Nate's here in the state, but originally, a lot of the fish came from the Nile region, like Egypt, the Middle Eastern region. A lot of them now, most of them are raised in China, Peru and Ecuador. But the original home of tilapia was in the Middle East area.

Marie: Interesting.

Sharon: Yeah, there's over a hundred species in the wild.

Marie: So let's hear why Nate chose tilapia.

Nate:

Initially, tilapia, it was like, whoa, why on Earth would I want to do that? You go around to the grocery stores and this fish is selling for dirt cheap. But the fact of the matter is it's coming from some foreign country and it's not being produced in probably an environmentally conscious or mindful way, plus the employees are probably not being treated or paid fairly.

But that is the image that tilapia has in this area, so growing tilapia wasn't driven by its salability. What drove me to farm with tilapia was their impact on our water, which is what we need – nutrients in our water in order to grow lettuce.

Environmentally, they can survive anything. They can live down to 60 degrees in a very healthy environment and they can handle water up to 110 degrees and not flounder. From an efficiency standpoint, that's the prowess that tilapia have. They are a strong fish that can survive in a lot of different cases.

From a growth standpoint, there's no doubt. I get these fish at about 4 weeks old. They weigh approximately 1/50 of an ounce. By the time they're 14 to 15 months, they weigh five pounds. It's an incredible amount of growth in a very short period of time. Anything that grows that fast eats a lot. Anything that eats a lot goes to the bathroom a lot. That's what we need. All of my nutrients are consumed in time through growing plants on floating rafts, so it only made sense.

My typical production from fish meat is around 20 pounds of fish meat per week. That's not much at all. But from that, I am growing annually around 1,000 heads of lettuce a week. For a grand total of 50-55,000 heads of lettuce. Each head of lettuce averaging 12-16 oz. So, if it's only taking 20 pounds to theoretically grow 800 pounds of plant-based material, that's pretty good.

Marie: You can really tell he used to be an engineer, with all the numbers he has down.

Sharon: Right. Even when I was there, you could tell he was keeping detailed records on all his fish tanks and how they were growing and the feed they were getting fed.

Marie: Yeah, he must have some awesome spreadsheets! (Laughs)

Sharon: Yeah, and your dad was an engineer, too, right, so…

Marie: Yeah.

Sharon: …you kind of know that way of thinking. And my dad was an engineer. Keeping those records kind of comes naturally when your brain wants to figure out why things are working and why things aren't, I think.

Marie: Yeah, it's a good skill to have and it also made me – you know he was talking about how tilapia can survive kind of survive anything – did you ever have fish tanks – try to keep fish alive when you were a kid?

Sharon: Not as a kid, but as an adult with children. So, I helped try to keep my children's fish alive and I am not an engineer. I think I'm pretty good with animal husbandry, but not fish. (Laughs)

Marie: Awww.

Sharon: No, we had fish for quite a while, and they all met different ends. My favorite fish was Zippy. My daughter found him on the side of the road, which is a strange place to find a fish.

Marie: Was it a goldfish or a tropical fish?

Sharon: It was a goldfish, right after the fair was in town. So, somebody must have put their prize on top of their car, and it rolled off into the ditch.

Marie: Oops.

Sharon: And my daughter found it. That fish lived for like five years. It was a good fish.

Marie: It must have been hardy to survive the fall.

Sharon: I like fish like tilapia that can survive almost anything. How about you, did you have fish?

Marie: Yeah, I inherited some aquariums from my older brother and he kinda taught me how to take care of them. They were tropical fish. I had fish for years, at one point even through college I had a Siamese fighting fish in a bowl. Although my roommate left the iron on too close to the bowl . . . (begins laughing)

Sharon: Oh that's horrible!

Marie: …and she boiled my fish! Other than that, I had really good luck keeping my tropical fish alive. I even ended up breeding . . . I really liked swordtails. I ended up breeding my biggest swordtails to my biggest swordtails. So, I had these huge swordtail fish that I would sell back to the store for credit.

Sharon: Oh, that's kind of fun.

Marie: Yeah, I had my own little fish breeding operation going. (Laughs) That was kind of fun.

Sharon: So, did they recognize you . . .

Marie: . . . When I'd come visit? No. I think they sold pretty fast.

Sharon: Oh, yeah.

Marie: Sometimes I think I might have recognized some of them, no, but I didn't really . . . (Laughs)

Sharon: So, on one of my stops this summer visiting aquaponics facilities – it was Valor Aquaponics near Milwaukee – the owner told me he wasn't going to sell his fish because they all recognized him. He was raising some koi along with the vegetables. It was true. He'd walk over and they would all be like, "Hello!" And I would walk over, and they would all like run away.

Marie: That was because he fed them, huh?

Sharon: No, there was one in particular that was super happy when he was around. It's fun. You know, farmers do love their animals and I think, you know, just spending time at Lake Orchard Aquaponics, it was clear that Nate really loved his job and his fish and respected them and treated them humanely.

Marie: Now, before we get into Nate's favorite things about aquaponics, I just want to remind people that we're going to be cooking some of these friendly tilapia (laughs) at the end of this show, so stay tuned for that. Yeah, but let's hear from Nate about his favorite thing.

Nate:

…lack of winter. (Laughs) To be honest with you, it's just a phenomenal environment. No doubt, it can be ten below zero, blowing cold in the middle of February outside, and if the sun is out, it will be 100 plus degrees in our greenhouse. You feel like you've escaped to the tropics. And that's our daily routine. After having run heifers and working outside for 13 years in all environments, this is very stable. And that's the whole point. It's sustainable. It is a stable environment and a stable business. I feel good about coming to work.

Sharon: I just love spending time with people who love what they do. It's so exciting to see careers through their eyes. And I think if anybody is interested in a career in aquaponics, talking to a person like Nate would be so inspiring just because he knows what he's doing, he's successful at it, and he can talk really knowledgably about the industry.

Marie: So where does he sell his fish?

Sharon: Locally, to local markets. Like I said, I was there for a tilapia boil, so he invited people from the community over for a small fee, and there was a band. It was such fun. It was a great way to build community.

Marie: For people who aren't familiar with this Wisconsin tradition, what is a fish boil?

Sharon: A traditional Wisconsin fish boil is done outside over an open flame. In Nate's case they had hired a team to come in with big propane torches and kettles. Then they boil up the water, throw some salt in, throw some potatoes, get that boiling to cook the potatoes. Then they pull the potatoes out and they put tilapia in to boil for about five minutes each.

Marie: Oh, so you don't cook them together?

Sharon: Not in this instance. In my fish boils, I have cooked them together. The potatoes start first. But because of the volume that was happening at Lake Orchard Aquaponics, they did them separately. The most exciting part about a traditional fish boil, outside – you don't do this inside, is the boil over. You

add this pulse of heat at the end, so it boils up and over. Not when you're using a propane burner, but when you're using a bonfire. So that gets rid of all the oils and foamy stuff on top, and it cleans out the pot.

Marie: It's like a volcano.

Sharon: It's very exciting, it's very exciting to be part of.

Marie: I did not know this about . . . I've never been to a fish boil.

Sharon: Yeah, next year, we're going to do a fish boil.

Marie: That'd be great!

Sharon: 2022. It was great to be there on the spot when people were eating the fish from this fish boil, and them knowing that the fish came from this really clean, well-run farm. And they were all so positive about it. They cleaned their plates. It was full of good comments and people really recognized that this is where the food came from and they were thankful to be there, eating locally.

Nate:

I would like people to understand that it's important to know where your food is coming from. When you buy a car, you typically go to a dealer that you feel comfortable with because you want to feel reassured that you are in a safe space, you're going to be taken care of, things like that. It surprises me to no end, how many people put things into their body and disregard anything about where it came from.

Our longest drive to be honest with you is around 25 miles. I deliver my lettuce in a 2005 Chrysler Town and Country with air conditioning. Not a refrigerated truck that drives across the state of WI. That, I think that is the way to go. I think it should be something where people can come and find the producer. I have people all the time walk in and ask can I peek in…. and if you want to tear off a piece of lettuce and try it, then I will let you do that, too.

Transparency should be key to anybody's success. If you don't know who's making it or where it's coming from, what is there to trust?

Marie: I think it's neat that he offers tours and wants to let people see what aquaponics is all about.

Sharon: I know. It's crazy because he's so busy. I don't know how he finds the time to give tours. But because of his passion about what he does and why, I think he really wants other people who are interested in the industry and maybe thinking about opening their own aquaponics facility to see how possible it is and how mindfully it can be done and ethically – all of those things that made his operation succeed.

Nate:

My hope is that more fish farmers say, you know what we should do with our fish waste? Grow plants. And I'm also hoping more hydroponic farmers say, you know what we should do instead of buying these expensive natural or organically certified fertilizers? Get some fish. They do work together very well.

When I first got into this, I did some extensive research on my own from a standpoint of how much it would have cost for me to get nutrients into my water that were certified natural and organic. And I pay

probably 1/5 of that cost in fish feed and fish cost, which means that what I produce out of the fish in terms of food is a profit to me straight out of the gate. Every ounce of fish meat that I have in here is justified as a full-on profit because I have saved so much money by using tilapia to produce nutrients for my plants. So, I hope that aquaculture and hydroponics can find each other in this state because they're all over the place and we could use more aquaponic farms. One every 30 miles of this stature would allow for growth and production for quite a region.

Music from "Zenith City" by Woodblind

Marie: And now it's time for the Fish-o-Licious part of our podcast, where we discuss fish recipes which, by the way, you can find on the Eat Wisconsin Fish website (eatwisconsinfish.org) along with photos. Plus, The Fish Dish podcast webpage. What dish do we have today, Sharon?

Sharon: I'm excited that we're going to be cooking pan-seared tilapia with mango salsa! It should be really excellent. And if you're a Packer fan, this would be super-cool to serve at a game because it's going to be green and gold.

Marie: Oh, how apropos.

Sharon: I thought so, too. (Laughs)

Marie: I have to admit that tilapia aren't my favorite fish sometimes because -- I used to eat them a lot because I know they're low on the food chain and they're supposed to be good for ya but the taste – they have sort of a nutty taste. They don't taste like your average walleye or fish you catch out of a Wisconsin lake, so they're a little bit different. But they can be a little bit off tasting. I hate to say this!

Sharon: That's because you're spoiled, Marie.

Marie: Oh! (Laughs)

Sharon: I hate to say that. No, we are so lucky in Wisconsin. We have some of the best freshwater fish on the planet. Like you said, the walleye, bass, pike. Tilapia are a low on the food chain fish, this is true. In some places, they're not grown in the best environment. So, sometimes you're tasting the . . .

Marie: The remnants . . .

Sharon: The remnants of the water in which they were raised. I think, maybe I said this earlier in this podcast, 50% of the tilapia that come to the United States are grown in China and they just have very different rules than we do here. If you're getting a tilapia from a place like Lake Orchard Aquaponics, it's a completely different environment with a completely different food source. Nate feeds pellets that are bug protein-based and fish meal-based. And so, his are certified as natural products and that's not true of every aquaponics facility in the world. If you're going for maybe the best tilapia is like Ecuador or Costa Rica or some of the South American countries if you can't get one that's grown in the U.S., particularly, in Wisconsin. The U.S. has really strict seafood rules and rules for farms. So, if you're buying a U.S. product, you can be pretty sure that it's grown in good waters.

Marie: Now, we're located in Superior, Wisconsin, so we're not near where Nate is. He's by Sheboygan, right?

Sharon: Correct.

Marie: Yeah, so ah, the tilapia we have, we're working with today is from Costa Rica. And you said Costa Rica's one of the good ones?

Sharon: Right, right. Well done. Marie picked up the food today. So yes.

Marie: Nate's noticed some of the taste issues with tilapia, too, and he has a way to counteract that.

Nate:

Tilapia can be, I guess what I would say, is sometimes referred to as an off-tasting fish. I put together a freshwater purge system. I actually run my fish for five days in fresh water to eradicate a lot of the oils and a lot of the dirtier taste in the fish. From a taste standpoint, I love them. We do smoked fish. We've pickled them with a lot of different recipes. We usually bake them. We grow a wonderful red veined sorrel. You can lay down a bed of that. Put some oil and more sorrel over the top and bake that red vein through the fish. So, we do a lot of different baking things with our fish.

Background sounds of a knife through a mango.

Sharon: I'm slicing up the mango.

Marie: So, tell us what's in this recipe, Sharon.

Sharon: First, I'm starting with the salsa part. So, there's going to be two mangoes, one jalapeno pepper, half a red onion and cilantro. That's for the green. Now, if you don't like cilantro you might try something like Italian parsley as a substitute or chives, or something to give it a little green, especially because you're going for the Packer colors.

Marie: Yes, the gold and the green.

Sharon: Yes, that's right. If you don't happen to have a mango. They're kind of like not grown in Wisconsin, during peach season, you can use peaches instead. That's part of the recipe on the website, you'll see peaches mentioned.

Marie: Oh, okay. Could you use canned peaches in an emergency?

Sharon: In an emergency, yes. (Laughs) All right, I think the oil is about ready. We're using sunflower oil this time. There's about an 1/8 inch in the bottom of the pan. And here I go, putting the first piece of tilapia in.

Sound of fish frying.

Sharon: I put a little bit of salt and pepper on it. I'm putting the thicker parts toward the middle so they can cook a little more. So fresh.

Marie: So, how long do we cook these for?

Sharon: About four to five minutes a side. They'll start turning opaque and that's when we can flip them over. One of the great parts about tilapia is they're a lower price point than many of the other fish that are available in the marketplace. That's what makes them the 'go-to' for supper clubs and some banquet events and things like that because they're so affordable compared to other species of fish. They're looking good.

Marie: Rather opaque!

Sharon: I'm going to flip the first one.

Frying sound intensifies.

Sharon: It smells good.

Marie: Anything fried smells good. (Laughter)

Sharon: I know, that's true. My friend said you can cook your shoe in butter and garlic, and he'd eat it.

(Laughter)

Marie: So, the fish is plated and with the salsa on top and some tomato slices for some color, too. Sharon's going to share with us her . . .

Sharon: So, here's the first bite. I have a bite of fish and some mango salsa and some cilantro, and . . . oh wow . . . awh . . . I think the zesty part of the salsa really makes it pop in your mouth. So early on, one of the things I learned about tilapia, I heard it called the tofu fish before because it takes on the flavor of what you're cooking it in. And that beautiful taste of the sunflower oil just shows through on this, too. So . . . yum!

Marie (with mouth full): Yeah, it is very good. They must have purged their fish in fresh water because it doesn't have that "off" taste to it you sometimes get.

Sharon: Right. No, this is a really clean-tasting fish, mild, doesn't taste fishy at all, really. It has a nice buttery almost flavor to it. You know what this would also taste really good in is a fish taco. Like if it was taco night.

Marie: Oh yeah, roll it up in a tortilla.

Sharon: Uh huh, maybe with a little bit of red cabbage, too.

Marie: Oh yeah.

Sharon: Or an avocado. I love putting avocadoes in my fish tacos.

Marie: Yeah, I would totally eat this again.

Sharon: Yep, it's one for the recipe box.

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Marie: That's it for this episode of The Fish Dish. For more information and fish recipes, visit Eat Wisconsin Fish on the web at eatwisconsinfish.org, plus Twitter and Facebook. Thanks go to Bonnie Willison with Sea Grant for her behind-the-scenes work on this episode, and to the band Woodblind for use of their music. Thanks for listening!